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STATISTICAL BULLETIN
Metropolitan Life Insurance Co.

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AN ATTAINABLE LIMIT OF THE LIFE-SPAN.

We are still far from having attained the limit of the life-span under the conditions of our present knowledge of preventive medicine and sanitary science. At least ten years could be added to the prevailing expectation of life for the average person in the United States, if the death rates already attained in certain countries, and in certain parts of our country, were to apply generally to our whole population. This was the principal conclusion drawn by Doctor DUBLIN, Statistician of the Metropolitan Life Insurance Company, in an address delivered before the Harvey Society at the New York Academy of Medicine.

From the observed experience of many localities in recent years the most favorable of the attained death rates were abstracted and a life table calculated along the following lines:

Hypothetical Life Table, Based upon Mortality Rates Attainable under Present Knowledge of Preventive Medicine and Public Health.

AGE	NUMBER LIVING IN SPECIFIED AGE INTERVAL	MORTALITY RATE PER 1,000	EXPECTION OF LIFE
0	100,000	38.21	64.75
1	96,179	10.00	66.30
2	95,218	4.20	65.97
3	94,818	2.80	65.24
4	94,552	2.25	64.42
5	94,339	1.85	63.57
10	93,648	1.14	59.02
20	92,269	2.34	49.82
30	89,772	3.26	41.06
40	86,318	4.70	32.49
50	81,542	7.19	24.08
60	73,882	14.29	16.01
70	56,213	56.45	9.17
80	22,818	130.28	5.29
90	3,110	249.62	3.03
100	67	401.91	1.85

The foregoing table shows that if the mortality rates predicated in the table are attained in the United States within the next two or three decades, and there is every reason to believe that they will be attained, the expectation of life at birth will be nearly sixty-five years, instead of the figure of fifty-five years which was the expectation of life in the United States Registration States in 1920.

Certain of the assumptions of mortality rates need a little explanation. The most important single item in a life table is the figure for mortality in the first year of life. Fifteen per cent. of all the deaths that occur each year are of children within the first year of age. Infant mortality cuts very heavily into the expectation of life. The death of an infant erases the entire expectation for that life, whereas a death at the advanced years, say beyond sixty, removes only comparatively few years of expectation. The reduction of infant mortality is, therefore, one of the most important elements in a programme of public health administration. In the foregoing table, we assumed a rate of 38.21 deaths under one year of age for each 1,000 births. This is not an unreasonable assumption, in view of what has happened to the infant mortality rate in recent years, and what is more than likely to happen within the next decade. It should be recalled that in a large number of cities in the United States, some of good size, there are infant mortality rates at the present time below 40 per 1,000. In New Zealand in 1920, the infant mortality rate was below 50 per 1,000 for the whole country. It should be recalled, also, that nearly all of the reduction in infant mortality during the past twenty years in the United States has been effected among infants beyond one month of age. There is a practically untilled field for conservation effort in the first month of life. Competent authorities have estimated that, through the detection and treatment of albuminuria and of syphilis in pregnant women, fully one-half of the mortality of infants under one month of age could be saved. The extension of good obstetrical service to the great body of American women also holds out high promise for a real achievement in the prevention of early infant mortality. The aim of the public health movement should be to have an infant mortality rate which is practically irreducible, and that condition has not yet been attained anywhere.

The mortality rates in the foregoing hypothetical life table at ages under five are about one-third of those reported in the United States Life Table for 1910. This assumption for the pre-school ages is also justifiable. We know, for instance, what need be done

to suppress diphtheria. This requires only the countrywide immunization of children against diphtheria, which has been practiced so successfully in a few localities, especially New York City. Whole communities must wake up to their responsibility for the immunization of children; through that realization alone will facilities be provided for the protection of the child population against a scourge which needlessly sacrifices 15,000 lives in the United States yearly.

The progress of the anti-tuberculosis movement, the effect of educational work and of hospitalization upon the infection of children has reduced, and will continue to reduce, tuberculosis mortality in the pre-school years. There is the unsolved problem of measles and scarlet fever etiology. No one may say that these two problems will not be cleared up within the next ten years. The child population in America will secure real protection some day against these causes of child morbidity and mortality. The problem of domestic and traffic accidents as it affects children is just about to be attacked in a comprehensive and result-bringing way.

For the mortality between five and ten years of age, we have assumed a rising proportion of possible reduction from about one-third at age five to about one-half at age ten. In the broad span of ages from ten to sixty years, we have assumed, also, that it is practicable in the near future to secure mortality rates approximately one-half those shown on the United States Life Tables for 1910. This assumption also, is, entirely reasonable. For tuberculosis, indeed, this reduction has already been accomplished. The accident toll has been very greatly reduced since the 1910 Life Table figures were compiled. The figures assumed in the foregoing table at the age range 10 to 60 years, are only 20 per cent. below those shown in New Zealand, fifteen years ago. Even in that country at that time, the tuberculosis death rates were fairly high and have since been reduced to a lower level. In the United States, if we may judge from the experience of limited groups of the population which have been brought under the influence of so-called life extension methods, we may hope for the diminution of disability and death from chronic diseases of the cardiovascularrenal system. In these isolated experimental groups, the progress of these chronic diseases has been arrested and death postponed, which is equivalent to substantial additions to the life-span. Further, the death rates assumed in the Hypothetical Life Table are already matched at some ages by the experience attained by the life insurance companies on their so-called Ordinary business. Even in these more favored groups, the com-

panies expect in the near future to accomplish substantial reductions in the experienced mortality.

Beyond age seventy, we have assumed, to be conservative, no reduction from the rates recorded in 1910. This assumption is in error on the side of conservatism. The death rates beyond seventy actually experienced in the United States Registration States in 1920 were slightly below those shown in the 1910 Life Table. Between ages sixty and seventy, reductions were assumed to change regularly from 50 per cent. at age sixty to nothing at age seventy.

And so, from this newer material, we may say again that in the near future an average life-span of sixty-five years is attainable as a result of the widespread application of what is at present known about the causes and the means of preventing the important diseases and conditions.

AN ENCOURAGING PHASE OF THE AUTOMOBILE FATALITY SITUATION.

The growing death toll from automobile accidents undoubtedly constitutes the one bad spot in the public health and accident situation in America to-day. One has only to read the statements appearing in the daily press to realize this. All available statistical information definitely confirms the steady and practically continuous rise from year to year in the mortality from this cause.

In view of the great and growing seriousness of the automobile situation as a whole, it is particularly gratifying to be able to report on one phase of the hazard which is actually declining. It appears from an analysis of the automobile fatalities among those insured in the Industrial Department of the Metropolitan Life Insurance Company that the rate has actually declined since 1919 among school boys and young men. From 1911 until 1919 there was a steadily increasing rise in every age group. The two years following 1919 have shown this change in the situation—a decline apparently concentrated in the ages between five and fifteen and, to a lesser degree, up to age twenty-five. On the other hand, the rate among children under five and at the ages over twenty-five is increasing. The rate of increase is most marked among those over 65.

Does this mean that the propaganda carried on in the schools and through the public press has actually borne fruit? It is among the boys of school age that a very large proportion of the automobile fatalities occurs. If, as the figures indicate, the influence of the police, safety and school authorities has taught caution in the play

habits of these boys, then a real step forward has been taken. On the other hand, the factors, whatever they may be, which have checked the rise in the death rate of boys and young men have failed to be operative in the case of very young children. During the same three years that have witnessed the decline referred to, there was an immense increase (61 per cent.) for children aged one to four. The situation is also discouraging with reference to those over 65. The very young children are too young to be impressed with safety lessons and the very old are not agile enough to avoid the ever-increasing hazard from the multiplication in the number of vehicles.

The following table shows the death rates for automobile accidents among Metropolitan Industrial policy-holders, by age groups, for the years 1911, 1919, 1920 and 1921:

Death Rates per 100,000 Exposed for Automobile Accidents. White Males in the Industrial Department of the Metropolitan Life Insurance Company. By Age and for Specified Calendar Years.

Age Period	1921	1920	1919	1911
All ages—one and over.	19.9	18.9	18.0	4.0
1 to 4	19.2	17.0	11.9	2.0
5 to 9	30.6	32.7	33.1	5.2
10 to 14	16.1	19.7	18.6	4.7
15 to 19	10.6	11.0	12.9	1.7
20 to 24	14.0	14.2	14.4	3.0
25 to 34	15.5	12.3	9.1	3.6
35 to 44	16.7	12.2	9.9	4.5
45 to 54	20.6	15.0	16.6	3.2
55 to 64	25.0	27.6	28.3	7.8
65 to 74	60.0	46.1	48.9	8.5
75 and over	84.7	46.4	48.5	24.5

REPORT OF THE COMMITTEE ON MUNICIPAL HEALTH DEPARTMENT PRACTICE.

The readers of these Bulletins will be pleased to know that the Committee on Municipal Health Department Practice of the American Public Health Association has completed its report and that the same has been accepted for printing by the United States Public Health Service as a Bulletin of the Service. It should soon be possible for those engaged in public health work to obtain a copy of this important document.

It will be recalled that the Committee began its work two and one-half years ago on a grant made by the Metropolitan Life Insurance Company for the purpose. Eighty-three of the largest cities of the United States were visited by representatives of the Committee and a comprehensive report made on each phase of public health practice. The report, which will form a volume of about 350 pages, covers the following sections: The health board and the health officer; expenditures of health departments; control of communicable diseases; tuberculosis; venereal disease; infant hygiene; school medical inspection; industrial hygiene; special clinics; public health nursing; the public health laboratory; milk inspection; food and drug inspection; sanitary inspection and sanitation; water supply; sewerage and sewage disposal; publicity and public health education; and vital statistics. Some of these have already appeared in the recent numbers of the public health journals of the country, and more especially in the *American Journal of Public Health*.

In announcing the completion of this work, the Company desires to express its gratification to have had an opportunity to further a project so valuable to the public health movement and its pleasure at the marked success which has crowned the work of the Committee.

THE DECAY AND LOSS OF TEETH.

The molar teeth are obviously the most important organs of mastication and their decay and loss are often serious causes of ill health.

An investigation of the teeth of 5,000 employees in two different industries showed that 47 per cent. of all first molars, 17 per cent. of all second molars and 14 per cent. of all second pre-molars were lost. This is equivalent to a loss of over one-half of the masticating efficiency of these workers. This condition is, in the judgment of expert dental authorities, fairly typical among adults and shows to what extent mastication and digestion may be interfered with through the impairment of the dental tissues.

Dr. Thaddeus P. Hyatt, Dental Director of the Metropolitan Life Insurance Company, has recently completed a study of the condition of the teeth among 8,068 pupils of different high schools in the City of New York which throws further light on this subject. He found that 15 per cent. of all the first molars were already missing among these high school children. Of the second molars, two per cent. were missing and of the second pre-molars, two per cent. were

missing. The older the children, the larger the proportion of missing molar teeth.

Equally important is the result of Dr. Hyatt's study on the dental surfaces which are most prone to decay. Thus, on the first molars of these school children, it was found that 62 per cent. had cavities on the grinding or occlusal surface; 18 per cent. had cavities on the front or mesial surface; 16 per cent. had cavities on the back or distal surface; five per cent. had cavities on the outside or buccal surface; and only two per cent. had cavities on the inside or lingual surface.

Much the same situation is found on the other molar teeth examined. Thus, of the second molars, 45 per cent. had cavities on the grinding surface. The other surfaces showed never more than three per cent. of the surfaces with cavities. On the second pre-molars, 11 per cent. had cavities on the grinding or occlusal surface; the other surfaces showed relatively small proportions of the surfaces decayed.

Dr. Hyatt concludes that at least 75 per cent. of the initial decay which results in the ultimate loss of molars begins on the occlusal or grinding surface. For preventive dentistry to become practical and effective, some procedure must be found which will reduce the susceptibility of the grinding surface to decay. This problem is now seriously engaging the attention of the dental profession.

The above findings are all the more important in view of the large number of children who show serious defects of the teeth even at the earliest ages. Studies of New York City school children showed defective teeth in 96.5 per cent. of all examined, with an average of nearly seven cavities per child. Any discoveries of methods which will prevent decay will certainly play a large part in maintaining the health and vigor of growing children.

NINETEEN TWENTY-TWO—ANOTHER EXCELLENT HEALTH YEAR.

For the first six months of 1922 the Bureau of the Census has announced a provisional death rate among the general population of 12.6 per 1,000. This amounts to a five per cent. increase over the first half of 1921 and is in fairly close agreement with the results shown for the Metropolitan policy-holders during the same period, among whom an increase of 5.9 per cent. occurred.

There is one very interesting and significant feature of the Census Bureau's report, however, which seems to have been quite generally

overlooked in the press comments on this subject. This is that the 1922 May and June figures show declines as compared with these same months in 1921. Obviously, it was the comparatively bad record of the first four months of 1922 that was responsible for the increase for the first half year. The 1922 health situation took a pronounced turn for the better in the late spring and the records of this Company indicate that this improvement has continued throughout the rest of the year. For each summer and autumn month a lower death rate has prevailed among the millions of Industrial policy-holders of this Company than was in evidence for the same month of last year. As 1922 draws to a close it becomes more and more obvious that but for the high mortality of the first quarter, due to a recurrence of epidemic influenza, the 1922 health record would stand as the lowest ever recorded—excelling even the remarkable one for last year.

HEALTH RECORD FOR NOVEMBER, 1922.

The November death rate of the Industrial policy-holders (8.2 per 1,000) is the lowest November figure recorded since that for this month in 1919 (7.8). Comparison with last year's November rates for important causes of death emphasizes the very satisfactory health situation now prevailing among the Industrial policy-holders. The typhoid fever, diphtheria, tuberculosis, cerebral hemorrhage, diarrheal disease, suicide and homicide rates are much below those of last November. The scarlet fever, cancer, Bright's disease and puerperal disease death rates show smaller reductions. The organic heart disease, pneumonia and Bright's disease figures are substantially the same as for November of last year. The measles mortality continues to run much higher this year than last, but as the 1921 record for this disease was the lowest in the history of the Company, the rise this year is not important. There were a few more deaths from influenza than occurred during November a year ago, but there are no signs of general epidemic prevalence of this disease; in fact the mortality now being recorded is just about the normal for non-epidemic years. Another unfavorable comparison must be presented for automobile accidents. We again call attention to the deplorably high death rate this year for this class of fatalities. The November rate (15.2 per 100,000) is 9.4 per cent. higher than that for November of last year (13.9) . As a matter of fact, in only two 1922 months to date (April and June) has the automobile acci-

dent death rate among the Industrial policy-holders fallen below that for the corresponding month of last year.

The death rate for the general population of the large cities of the United States in November was 12.2 per 1,000. As was expected, this is considerably higher than that for October (11.3). It is also higher than for November of last year (11.6).

There seems to have been higher morbidity during November, 1922, from influenza, malaria, measles and whooping cough than for the same month last year; but decreases are noted in the occurrence of diphtheria, poliomyelitis, scarlet fever and smallpox.

Available diphtheria reports for the month show clearly a lower prevalence as compared with November a year ago. During the first three weeks of the month, for example, there were reports of but 481 cases in Kansas as against 1,422 for the corresponding period of 1921. The figures for California, Colorado and Indiana as well as for other states, show much less diphtheria. There was an increase, however, in Illinois.

In Philadelphia measles was epidemic from the middle of October to the first of December when about 6,000 cases with 66 deaths were reported. Epidemics of scarlet fever have been experienced in Harrisburg, Pa., and Chardon, Ohio. In the latter, schools, churches and theatres were ordered closed, owing to the prevalence of the disease.

With the exception of Denver, the smallpox situation was improved in November, although there were considerable increases in the prevalence of this disease in Wisconsin and Illinois.

In Franklin Borough, N. J., thousands of residents were inoculated with anti-typhoid vaccine. This followed the deaths of five persons, the infection being traced to polluted water. A typhoid outbreak occurred in Annville, Pa.

Improvement is reported in the dengue fever situation in Southern states to the seriousness of which we called attention in the November BULLETIN. The morbidity during November was much lower in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi and Texas. In the last named state, however, 3,171 cases were reported during the first two weeks, so that the improvement was noted only during the later part of the month. In this state 222 cases were also reported in the first week of December.

The table below shows the mortality among Industrial policyholders for November, 1922, October, 1922, November 1921 and for the year 1921.

METROPOLITAN LIFE INSURANCE COMPANY.

Death Rates per 100,000 for Principal Causes, Premium-Paying Business in Industrial Department.

(Annual Basis)

MONTHS OF OCTOBER AND NOVEMBER, 1922, AND OF NOVEMBER 1921.

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED			
	Nov., 1922	Oct., 1922	Nov., 1921	Year 1921
TOTAL—ALL CAUSES	819.2	786.4	858.2	870.6
Typhoid fever	6.0	9.4	8.9	6.7
Measles	2.2	1.3	.7	3.2
Scarlet fever	4.1	3.9	5.7	7.0
Whooping cough	1.8	2.0	1.7	3.9
Diphtheria	25.2	19.4	31.5	23.8
Influenza	7.0	4.9	5.3	8.7
Tuberculosis (all forms)	90.6	101.4	97.7	117.4
Tuberculosis of resp'y system	82.5	91.5	88.7	105.6
Cancer	69.3	70.8	71.9	71.7
Cerebral hemorrhage	53.6	55.7	64.2	62.1
Organic diseases of heart	121.6	104.2	121.4	117.4
Pneumonia (all forms)	63.1	40.4	62.7	67.8
Other respiratory diseases	14.8	11.5	15.5	14.1
Diarrhea and enteritis	8.8	13.5	13.6	14.2
Bright's disease (chronic nephritis)	69.4	67.4	70.9	68.0
Puerperal state	15.3	16.2	16.7	19.8
Suicides	4.8	6.3	6.0	7.6
Homicides	5.5	7.4	6.5	6.7
Other external causes (excluding suicides and homicides)	60.2	54.0	52.8	57.6
Traumatism by automobile	15.2	15.3	13.9	12.2
All other causes	195.8	196.7	204.5	192.9

Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

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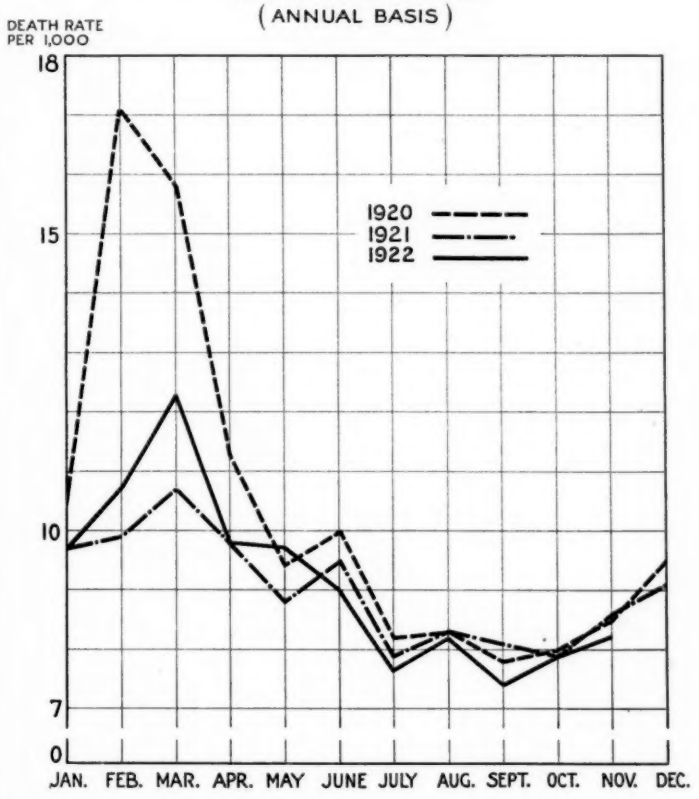
DEATHRATE *per* 1,000 IN SPECIFIED MONTHS OF 1920, 1921, 1922

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)



	1920	1921	1922
JAN.	10.4	9.7	9.7
FEB.	17.1	9.9	10.7
MAR.	15.8	10.7	12.3
APR.	11.3	9.8	9.8
MAY	9.4	8.8	9.7
JUNE	10.0	9.5	9.0

	1920	1921	1922
JULY	8.2	7.9	7.6
AUG.	8.3	8.3	8.2
SEPT.	7.8	8.1	7.4
OCT.	8.0	7.9	7.9
NOV.	8.5	8.6	8.2
DEC.	9.5	9.1	